

09/845,231

F0630/AMDP630US

AMENDMENTS TO THE CLAIMS

Listing of the Claims:

1. (Previously presented) A system for controlling a thin film deposition process, comprising:

one or more thin film deposition components that deposit a thin film on one or more portions of a wafer;

a thin film deposition component driving system for driving the one or more deposition components;

a system for directing light on to the deposited thin film and collecting light reflected from the deposited thin film;

a scatterometry system that detects structural irregularities associated with the deposited thin film by comparing reflected light data associated with the deposited thin film with a database comprising known thin film reflected light signatures; and

a processor that communicates with the scatterometry system and the thin film deposition component driving system, the processor analyzes the deposited thin film by partitioning a conceptual mask into a plurality of grid blocks mapped on the wafer and determines deposition parameter adjustments for the one or more deposition components, the deposition parameter adjustments based at least in part upon data received from the scatterometry system.

2. (Previously presented) The system of claim 1, the scatterometry system captures the light reflected from the thin film.

3. (Previously presented) The system of claim 1, the structural irregularities associated with the thin film include at least one of pinholes, depressions, air bubbles, bumps, voids, agglomerates, large grains, second phase compositional variations and impurities, or a combination thereof.

09/845,231F0630/AMDP630US

4. (Previously presented) The system of claim 1, the processor further determines the deposition parameter adjustments based in part on a presence of an unacceptable thin film deposition condition at the one or more grid blocks according to the data received from the scatterometry system.
5. (Previously presented) The system of claim 1, the deposition parameter adjustments comprise at least one of thickness, uniformity, rate of deposition, pressure, flow rates of reacting species, flow rate of carrier gas and temperature or a combination thereof.

6-27. (Canceled)

28. (Previously presented) A method for monitoring and controlling the deposition of a thin film, comprising:

depositing the thin film at a plurality of portions of a wafer;

using a processor to partition the thin film into one or more conceptual grid blocks;

directing a light within the one or more grid blocks associated with the thin film;

collecting a light reflected from the one or more grid blocks associated with the thin film;

employing a scatterometry system to analyze the reflected light from the one or more grid blocks associated with the thin film to determine one or more properties of the thin film;

monitoring structural irregularities of the deposited thin film by comparing reflected light data collected from the one or more grid blocks associated with the thin film with a database comprising known thin film reflected light signatures;

controlling a deposition component to deposit thin film at the one or more portions of on the wafer by utilizing a non-linear training system which facilitates determining deposition parameter adjustments according to the properties of the thin film; and

using the processor to determine deposition conditions at the one or more portions of the wafer and to control the at least one deposition component based at least in part on data received from the scatterometry system.

29. (Previously presented) The method of claim 28, the properties include at least one of thickness, uniformity, presence of defects, and presence of impurities or a combination thereof.

09/845,231F0630/AMDP630US

30-34. (Canceled)

35. (Currently amended) A method for regulating a process for depositing a thin film, comprising:

using one or more deposition components to deposit a thin film;
using a processor to partition the thin film into one or more conceptual monitoring zones; determining the characteristics of the deposited thin film at the one or more monitoring zones by utilizing reflected light to generate a signature and comparing the signature to known thin film reflected light signatures; and
using the processor to coordinate control of the one or more deposition components to deposit subsequent thin film, the coordination based at least in part on the characteristics of the deposited thin film data gathered from comparing the reflected light from the one or more monitoring zones to known thin film light signatures.

36. (Currently amended) A system for regulating a process for depositing a thin film, comprising:

means for using one or more deposition components to deposit a thin film;
means for determining the acceptability of the thin film deposition at one or more grid blocks by utilizing reflected light and comparing to known thin film reflected light signatures; and
means for using a processor to map the thin film into one or more grid blocks on a conceptual coordinate system to coordinate control of the one or more deposition components to deposit the thin film, and to determine the acceptability of the thin film deposition by comparing the known thin film signatures to reflected light.

09/845,231F0630/AMDP630US

37. (Previously presented) A system that controls the deposition of a thin film on a wafer, comprising:

at least one deposition component employed to deposit a thin film at one or more portions of the wafer;

a coherent light source directed onto one or more conceptual grid blocks of the thin film;

a receiving component that collects light reflected from the thin film;

a scatterometry system that analyzes the reflected light to determine one or more properties of the thin film at the one or more grid blocks; and

a processor that controls the at least one deposition component based at least in part on data received from the scatterometry system.